I have named this minute but beautiful hydroid after Colonel Stuart Wortley, in whose tanks it was first found. It grows along the glass sides of the tank, sending out long creeping shoots, whence the polypites rise at intervals.

It has recently appeared suddenly in my tanks, and, I fancy, is not uncommon, though liable to be overlooked through its minute size.

XIX.—*The Muscular Anatomy of the Koala* (Phascolarctos cinereus). By Alexander Macalister, M.B., Professor of Zoology, University of Dublin.

A fine female Koala was procured from Mr. Gerrard by Prof. Haughton for the Anatomical Museum of the Dublin University; and as it was in splendid condition for dissection, we were enabled to examine its muscular system thoroughly. As in its anatomical arrangements it is by far the most aberrant form among the Marsupials, I have compiled the following list of its peculiarities, from which it will be perceived that the myology of this animal is full of interesting features.

The specimen was a salted one; but its muscles were exceedingly well preserved and easily dissected. She measured 26 inches in length; and throughout there was a marked disproportion in the development of the two sides, the left-side muscles being very much larger and stronger than the right. There was an exceedingly strong *panniculus carnosus*, which sprang from the outside of the arm, and the fibres of which passed backwards in an arcuate manner to the integument of the sides; and forward, forming a very thick *platysma myoides* in the neck; this muscle had a thick rounded anterior border, and terminated by being inserted into the skin along the ramus of the mandible; and, stretching even above this limit, the facial fibres formed an even sheet over the front of the *masseter* and the facial artery to terminate in the middle line of the lower lip, the margin of the mouth, the ala of the nose, and the lower margin of the orbicular muscle of the eyelids.

The *platysma* on the hinder part of the body displayed nothing of importance; its femoral attachment was weak.

The facial muscles were unusually strong, the *orbicularis palpebrarum* being a simple thick ring, composed of several thick fascicles; the *occipitalis* arises from the occipital protuberance, and passes radiating forwards; the *frontalis*, quite separate, arises from the mesial line of the scalp, and runs

downwards to the inner half of the upper edge of the *orbicularis palpebrarum*, extending into the origin of the *levator labii superioris*.

The large auricle had a powerful arrangement of muscles for its motions, having three series of transverse intrinsic fibres on the back of the concha, and a strong bilaminar *retrahens aurem*, which came from the occipital protuberance, external and attached to the *occipitalis*, and was inserted by the superficial layer of fibres into the back of the auricle; the deep layer bifurcated into two muscular bundles—an upper to the upper and anterior part of the auricle, and a lower to the inferior part of the same cartilage.

The *attollens aurem* was thin and wide; and the *attrahens* was a very strong wide slip, inseparable from the *platysma*; a second special *attrahens* existed in the form of a flat fleshy slip from the anterior half inch of the temporal crest behind the postorbital process, which ran downwards and backwards over the temporal fascia and zygomatic arch to the inferior margin of the helix: the lowest third of this muscle is tendinous. The other facial muscles were a single-headed *levator labii superioris alæque nasi*, a *depressor labii inferioris*, and *levator menti*. I found no muscles attached to the angle of the mouth other than the wide continued sheet of the *platysma*. The *orbicularis oris* was strong, but the *buccinator* was very feeble. A *depressor labii superioris* from the upper alveolar arch completes the catalogue. There was no zygomatic or buccal salivary gland.

The masticatory muscles were arranged as in all the Marsupials, and equalled the pectorals in weight (*masseteres* + *temporales* = 1·4 oz.).

The *external pterygoid* is an exceedingly small rudiment, crossing and inseparable from the internal.

The *sterno-mastoid* was four times the size of the *cleido-mastoid*, and was inserted fleshy into the outer side of the elongated paroccipital process. The latter had a tendinous insertion, and was attached more internally to the same process; its origin was by a fine flat fleshy band from the inner sixth of the clavicle.

The *omo-hyoid* arose far back from the præscapula near its superior angle; it had no tendinous inscription, and was inserted into the hyoid body and into a tendinous line in the angle between the *digastric* and *sterno-hyoid* muscles, to both of which it is connected. The posterior belly of the *digastric* is exceedingly small and short, and arises from the front of the paroccipital process; it ends in a tendinous inscription which gives partial origin to the anterior belly; but this latter part

is treble the size of the posterior, gaining an additional origin from the tendinous line in which the *omo-* and *sterno-hyoid* muscles terminate. The tendinous inscription is very short and oblique.

Sterno-hyoid is monogastric, and has a strong origin from the back of the clavicle as well as from the second and third pieces of the sternum. *Sterno-thyroid* is much shorter and more narrow, and has likewise no inscription. *Mylo-hyoid* has very short fibres, and extends down for a very considerable distance, overlying the very long slender *genio-hyoidei*. A transverse band of muscle, like an aberrant slip of the *mylo-hyoid*, crossed beneath the *genio-hyoidei* and superficial to the *genio-hyo-glossi*; this is on each side attached to the mucous membrane. The styloid group of muscles formed a single sheet, the hinder fibres of which passed to the pharynx, the middle to the cerato-hyal under the stylo-hyoid ligament; the anterior passed to the side of the tongue. *Genio-hyo-glossi*, the palatine muscles, and *linguales* are very normal.

The *trapezius* is an indivisible sheet extending from the inner third of the occiput to the seventh dorsal spine; its insertion is into the acromion and spine of the scapula; and, partly crossing the former, some of its fibres are inserted into the surface of the tendinous fibres of origin of the *deltoid*. The *latissimus dorsi* arose from the fourth to the tenth dorsal spines, and, by the lumbar fascia, from the four spines below these; it had no costal origin.

The *trachelo-acromial* (*omo-atlantic*) occupied by its insertion one half the length of the spine of the scapula, and was much thicker than usual. The *rhomboid* muscle is single and large, half the size of the *trapezius*; it occupies one half the occipital curved line, the middle line of the nucha, and the three upper dorsal spines. *Serratus magnus* was a single muscle consisting of thirteen slips, six cervical and seven costal, whose insertion was indivisible; *serratus posticus superior* extends in its insertion from the second to the eighth rib; *serratus inferior*, quite continuous with it, only distinguishable by the upward direction of its fibres, was attached to the ninth, tenth, and eleventh ribs. *Splenius* arose from the three upper dorsal and five lower cervical spines, and was attached to the occiput and three upper cervical transverse processes. *Trachelo-mastoid* is not digastric, and stretches from the five lower cervical transverse processes to the occipital bone. The other spinal muscles were invariable.

The *great pectoral* is large, having the usual attachments; beneath it there are the following three muscles:—*pectoralis minor*, from the cartilages of the third and fourth ribs to the shoulder-

capsule; *pectoralis quartus*, from the cartilages of the lowest four ribs to the shoulder-capsule; and a third pectoral (*pectoralis minimus* of Wenzel Grube), from the manubrium sterni and cartilage of the first rib to the shoulder-capsule. The *subclavius*, under a strong costo-coracoid membrane, stretches to the posterior margin of the outer third of the clavicle.

The *deltoid* is a single muscle, composed of its three parts united inseparably, and sending an extensive offshoot at its insertion, which is continuous into the origin of the *supinator longus*. The capsular muscles are developed in the following proportions:—*deltoid*=1, *supraspinatus*=1·11, *infraspinatus* =1·69, *teres minor* (exceedingly thin, with a marginal tendinous origin for one fifth the axillary costa of the scapula and an unusually wide fleshy insertion) =·08, *subscapularis* =2, *teres major*=1.

The *biceps* is, as usual in Marsupials, composed of a partially united *gleno-ulnar* and a *coraco-radial* muscle; the latter receives a large fascicle from the former; the *brachialis anticus* is long; the *triceps externus* and *internus* are united; and the muscles of this region have to each other the following proportions:—*biceps coracoidalis* =1, *glenoidalis* =0·68, *brachialis* =0·8, *triceps longus*=2, *triceps externus* and *internus*=2·6, *dorsi epitrochlearis* (which is inserted into the inner condyle and olecranon)=0·44. There are two *anconæi*, external and internal.

The *pronator* and *supinator* muscles are well-developed. The *round pronator* has but one head; and the *quadrate pronator* occupies the lower sixth of the forearm. *Supinator longus*, besides an origin from the *deltoid*, is attached to the lower half of the humerus; and its tendon, passing under the tendon of the *abductor major pollicis* and lying on the wrist synovial membrane, was inserted into the scaphoid bone. The *supinator brevis* occupies two fifths of the radius. These muscles are developed in the following proportions:—*Pronatores* : *supinatores* :: 1 : 4.

The other muscles in the forearm are well marked. The radial and ulnar flexors of the carpus and the *palmaris longus* are simple and normal; the *flexor sublimis digitorum* arises from the front of the deep flexor, and is exceedingly feeble; its tendon for the fourth finger is the strongest. The deep flexor consists of four heads—one condyloid, one olecranal, one radial, and one ulnar; five tendons spring from this; but the pollical tendon is not from the radial border of the common tendon, but springs from the front of the tendon inside the edge, as is sometimes the case in the Quadrumana.

The *extensores carpi radiales* are as usual, and are inserted, not into the carpal ends, but into the middle of the shaft of

their respective metacarpal bones. The *extensor secundus digitorum* was attached to the fourth and fifth fingers. The other extensors of the fingers, ulnar carpal extensor and *extensor secundi internodii pollicis*, are as usual.

The *abductor pollicis major* has a radio-interosseal origin and a double tendon of insertion into the trapezium and first metacarpal. The left *indicator* sent a filmy slip to the pollex. There is a separate *extensor medii digiti*, with an ulnar origin. The proportions of these muscles are as follows:—flexors of the wrist (*f. c. r.*, *p. l.*, *f. c. ul.*) : extensors of wrist (*e. c. r. l.* & *b.*, *e. c. ul.*) :: 0·36 : 0·75; flexors of fingers (*f. d. s.*, *f. d. p.*) : extensors (*e. d. c.*, *e. d. s.*, *e. oss. m. p.*, *e. s. int. p.*, *e. i.*, *e. m. d.*) :: 0·21 : 0·36.

The hand-muscles are as follows:—For the pollex, an *abductor brevis*, a single-headed *flexor*, an *opponens*, and an *adductor* (from the third metacarpal). For the little finger there are the following muscles:—*abductor*, *opponens*, and *flexor* muscles. The dorsal interossei are (1) a two-headed *abductor indicis*, (2) a two-headed *abductor medii*, (3) a bicipital *abductor medii*, (4) an *abductor quarti digiti*; the palmar interossei are (1) an *adductor indicis* from the second metacarpal under the *adductor pollicis*, (2) a common *adductor* of the third and fourth digits.

There is no *scalenus anticus*; the *medius* is attached to the first rib and to the fourth to the seventh vertebræ; the *posticus* from the fifth transverse process to the third rib. *Longus colli* consists of three parts—one from the bodies of the upper five dorsal vertebræ to the cervical transverse processes, a second part from the transverse processes of the fourth to the seventh cervical vertebræ extending to the cervical bodies (second to fifth), and a third from the same origin to the occiput.

The *external oblique* is attached to the ribs from the third to the eleventh; the *internal oblique* and *transversalis* are with very great difficulty separable. The *rectus abdominis* has eight lineæ transversæ intersecting it, and is attached to the xiphisternum and to the cartilages of the second to the sixth ribs. *Pyramidalis* is very wide, covers the entire of the *rectus*, and is attached to the linea alba. The lumbar vertebræ, besides the ordinary *quadratus lumborum* (with its three usual component parts), have attached to them anterior *intertransversales*, most of whose fibres skip two vertebræ. The *psoas parvus* is equal to the *psoas magnus* and 0·37 times the size of the combined *psoas magnus* and *iliacus*, whose elements are imperfectly separable; the latter part of this mass is bipartite, the portion most closely united to the *psoas magnus* being separate from a part of the muscle arising from the anterior superior iliac spine.

The *sartorius* is wide, and inserted into the inner side of the patella, as well as into the knee-capsule and tibia. The *pectineus* is double at its insertion, but has a single origin. The *adductor longus* is inserted posterior and superior to the pectineus, and is very small, but attached to the marsupial bone, as Prof. Owen observes. The rest of the adductor mass exhibits a faint division into the three usual elements, the condyloid and the anterior and posterior strata of *magnus*. *Quadratus femoris* has a narrow ischiatic and a very wide femoral attachment occupying the upper sixth of the femur; it is, however, with great difficulty separated from the *adductor magnus*.

The *gluteus maximus* is bilaminar, the sacral part overlapping the coccygeal; its insertion is into the whole length of the linea aspera. The *gluteus medius* is bilaminar, and the *pyriformis* is perfectly separate, arising from the front surface of three vertebræ; over this muscle passes the sciatic nerve. *Gluteus minimus* arises from the acetabular margin and from the surface behind it, as well as from the anterior margin of the ilium. I could separate no *tensor vaginæ femoris*.

Rectus femoris had but a single head; and the other elements in the extensor mass formed but one continuous belly, in which the *vastus externus* portion is by far the largest factor. The hamstrings are the usual three; and none of them exhibits a trace of a tendinous inscription. *Biceps* has a narrow tendon of origin 1″·25 in length from the sacrum, which is tied down to and parallel with the great sciatic ligament; the insertion is wide and fleshy. The proportionate development of these muscles is as follows:—*rectus*=1, *biceps*=1, *semimembranosus*=1·45, *semitendinosus*=0·80, rest of the *quadriceps extensor*=3·58. Thus the flexors : extensors :: 1·87 oz. : 2·11 oz. (I have included the *gracilis* with the flexors; it has a pubic origin and a slender insertion, and equals the *semitendinosus* in weight.)

The *popliteus* muscle arises from the fibula alone, and is inserted into the tibia close to the *tibialis posticus*.

The outer head of the *gastrocnemius* has a sesamoid bone in its tendon of origin; the inner head, which is only half its size, has no such bone. *Plantaris* arises from the sesamoid bone, inseparable from the outer head, and does not become distinguishable until about the lower third of the leg; its tendon is inserted into the fascia of the foot on the inner side of the heel. We could not separate any *solæus* from the *gastrocnemius externus*.

The common flexor of the toes had an origin mainly fibular, and sent off five tendons, those of the second and third toes being closely joined for the longest portion of their extent.

Tibialis posticus is double:—a larger muscle, placed rather more superficially, and inserted anteriorly into the sesamoid at the base of the hallux; a smaller, deeper muscle, inserted into the entocuneiform and second and third metatarsals.

The perforated flexor of the toes was a very remarkable muscle; it lay, not in the foot as usual, but on the back of the leg, arising from the surface of the *flexor profundus* for the lower half of the leg, exactly like its homotype the *flexor sublimis* in the forearm; its fleshy portion does not extend below the ankle; but its tendons pass to the second, third, fourth, and fifth toes. There is no *flexor accessorius* in the foot; but a muscle, evidently similar to this in nature, passes from the calcaneum to the sesamoid at the base of the hallux.

There is a long *peronæus* which arises from the upper half of the fibula and from the sesamoid bone of the *gastrocnemius externus*; this is inserted as usual. *Peronæus brevis* is also normal, and quite separate from the *peronæus quinti*, below which it arises. There is also a *peronæus quarti metatarsi* in front of the *quinti*, perfectly separate from it and placed behind the malleolus.

Tibialis anticus and *extensor hallucis* are normal. The *extensor digitorum* sends off four tendons; but those for the second and third digits are connected until very close to their insertion.

On the back of the leg there is a large *pronator quadratus* like that in the leg of other Marsupials and the crocodile; this occupied more than half the length.

The foot-muscles are the following:—For the hallux there is an *abductor*, a bicipital *flexor brevis*, an *opponens* (from the inner cuneiform to the metatarsal), and an *adductor* (from the second metatarsal to the hallux); there is also an "*interosseus primus volaris*," like Henle's interosseous in the manus. For the little finger there is an *abductor* proper and a separate *abductor ossis metatarsi minimi digiti* (Flower). There is no *lumbricalis* for the second digit; that for the third comes from the tendon for the third digit alone; that for the fourth comes from the third and fourth tendons; and that for the fifth comes from the fourth tendon.

The *interossei* are arranged as follows:—The dorsal are: (1) *abductor indicis*, bicipital; (2) *abductor medii*, bicipital; (3) *abductor quarti*, also two-headed; (4) *abductor quarti*, with only one head from the fourth metatarsal. The palmar are: (1) *adductor hallucis*, as before mentioned; (2) *adductor indicis*; (3) *adductor* (?) *medii*, from the second metatarsal to the fibular side of the third, whose metatarsal it crosses; (4) *adductor minimi digiti*. There is also a very small *opponens minimi digiti* inserted into the metatarsal of the fifth toe.

Prof. Owen has said that among the Marsupials "the Koala has the best claim to typical preeminence" (Todd's Cyclop. vol. iii. p. 329); and certainly from the foregoing account it will be seen that this animal presents, in its muscular system, a greater number of structural divergences from the general placental type than, perhaps, any other Didelphian.

XX.—*On a new Genus of Hexaradiate and other Sponges discovered in the Philippine Islands by* Dr. A. B. Meyer. By Dr. J. E. Gray, F.R.S. &c.

Dr. Adolf Bernhard Meyer has brought with him some beautiful species of hexaradiate sponges, which he obtained at Talisay on Cebu, in March 1872, and they are now in the collection of the British Museum.

The two principal sponges discovered by Dr. Meyer would form two very distinct families according to the classification published in the Ann. & Mag. Nat. Hist. 1872, June, p. 442. They both belong to the order Coralliospongia. Before I proceed to define them I may remark that the order may be divided into three groups:—

I. The normal Coralliosponges have elongate subulate rays to the hexaradiate spicules, which are generally smooth, but one or more of them may be covered with spines or lobes directed towards the tip. This group contains the first ten families in the paper above referred to. The genus *Crateromorpha* here described appears to belong to it.

II. This group, which may be considered the abnormal form of the order, has the hexaradiate spines with short uniform rays of equal length, each ending in a number of reflexed lobes, and forming in their completely developed state a cube.

It will contain two families, and may be thus divided:—

A. *Sponge sessile, attached.*

Fam. 1. **Carteriadæ.**

B. *Sponge free, attached to the bottom of the sea by tufts of elongate anchoring fibres.*

Fam. 2. **Meyerinidæ.**

Sponge elongate, tubular, covered with a cobweb-like netted coat, with a circle of tufts of anchoring fibres at the base, which extend more than halfway through the length of the body, and